DRENO

CE

Serie : # A-G-H-V

Installazione e istruzioni per l'uso (I)

Installation and operating instructions (GB)

Installation et notice d'utilisation (F)

**N° A 07.1**

# *TABLE OF CONTENTS*


| | |
|---|---|
| **1. SAFETY.** | **Pag.1** |
| **2. EXPLANATION OF LABEL.** | **Pag.2** |
| **3. WARRANTY.** | **Pag.2** |
| **4. SERVICE FEATURES.** | **Pag.3** |
| **5. TECHNICAL SPECIFICATIONS.** | **Pag.3** |
| 5.1 Materials. | Pag.3 |
| 5.2 Bearings. | Pag.3 |
| 5.3 Electric motor. | Pag.3 |
| 5.4 Electric cable. | Pag.3 |
| 5.5 Mechanical seals. | Pag.4 |
| 5.6 Impellers. | Pag.4 |
| **6. TECHNICAL DATA** | **Pag.5-6** |
| **7. INSTALLATION.** | **Pag.7** |
| 7.1 Safety rules. | Pag.7 |
| 7.2 Rules for a correct installation. | Pag.7 |
| 7.2.1 Rules for a proper installation. | Pag.7 |
| 7.2.2 Delivery piping. | Pag.8 |
| 7.2.3 Electrical connections. | Pag.8 |
| 7.2.4 Overload protection. | Pag.8 |
| 7.2.5 Level switch. | Pag.8 |
| **8. START-UP.** | **Pag.8** |
| **9. PROPER INSTALLATION.** | **Pag.9** |
| **10. TYPES OF INSTALLATION.** | **Pag.9** |
| 10.1 Fixed submerged installation whit quick coupling system. | Pag.9 |
| 10.2 Mobile submerged installation. | Pag.9 |
| **11. OVERALL DIMENSIONS FOR STATIONARY INSTALLATION .** | **Pag.10-11** |
| **12. OVERALL DIMENSIONS FOR MOBILE INSTALLATION.** | **Pag.11** |
| **13. ELECTRICAL CONNECTIONS.** | **Pag.12** |
| **14. ELECTRICAL DIAGRAMS.** | **Pag.12** |
| **15. KICK BACK AT START UP.** | **Pag.13** |
| **16. MOTOR PROTECTION.** | **Pag.13** |
| **17. OPERATING RULES** | **Pag.13** |
| 17.1 Transport. | Pag.13 |
| 17.2 Below zero temperatures. | Pag.13 |
| 17.3 Cleaning. | Pag.13 |
| 17.4 Pump body breather pipe. | Pag.13 |
| 17.5 Storage. | Pag.13 |
| 17.5.1 Storage of new pumps. | Pag.14 |
| 17.5.2 Removal and storage. | Pag.14 |
| 17.5.3 If the pump is in place ready to work. | Pag.14 |
| 17.5.4 Operations during storage. | Pag.14 |
| **18. INSPECTIONS AND MAINTENANCE** | **Pag.14** |
| 18.1 Recommended inspections. | Pag.14-15 |
| **19. REPLACEMENT OF WORN PARTS.** | **Pag.15** |
| 19.1 Replacement of the impeller. | Pag.15-16 |
| 19.2 Replacement of the seals. | Pag.16 |
| 19.2.1 Replacement of impeller-side mechanical seal. | Pag.16 |
| 19.2.2 Replacement of motor-side mechanical seal. | Pag.16 |
| **20. OIL REPLACEMENT.** | **Pag.16** |
| **21. INSPECTION OF MOTOR INSULATION.** | **Pag.17** |
| **22. TOOLS.** | **Pag.17** |
| **23. SPARE PART DESCRIPTION.** | **Pag.18-19-20** |
| **24. TROUBLESHOOTING.** | **Pag.21-22** |
| **25. INTERVENTIONS RECORDING .** | **Pag.23** |
| **26. DECLARATION OF CONFORMITY.** | **Pag.24** |

## SYMBOLS CONTAINED IN THE MANUAL

WARNING AGAINST ELECTRIC RISKS
Safety symbol, as per DIN 4844-W8

GENERAL DANGER SYMBOL
Safety symbol, as per DIN 4844-W9

**WARNING:** THIS WORD IS SPECIFIED BY THE SAFETY REGULATIONS; FAILURE TO COMPLY WITH SUCH WARNING COULD ENDANGER THE MACHINE AND ITS OPERATION.

## Safety.

When installing, servicing and operating the machine, adhere to the basic directions provided by the manual. It is therefore extremely important that the manual be read before the equipment is installed and started by skilled installers and the equipment operator.
The manual should always be kept at hand in the place in which the machine is used.

## Risks deriving from failure to comply with safety rules.

Failure to comply with safety rules could cause substantial damage to people, the environment, the machines, and could lead to forfeiture of the right to claim damages.
The most common risks deriving from failure to comply with safety rules are:
- Damage to important functions of the electropump or equipment.
- Hazardous materials being scattered around.
- No maintenance.
- Injuries to people, caused by mechanic gears, electric or chemical effects.

## Safe operations

For your own and other people's safety, adhere to the safety directions provided by this manual, the national accident-prevention regulations, as well as the company's internal regulations on operation, safety and work.

## Alterations and spare parts.

The elctropump may not be changed or altered without the manufacturer's authorisation. To repair the electropump, use only original spare parts, which are key to safety.
If different spare parts are used, we shall not be held liable for any resulting damage.

## Maintenance, inspection, assembly operations.

The equipment operator shall make sure that all maintenance, installation and inspection operations are performed by skilled and authorised staff.
Before working on the electropump, make sure it is off and disconnected from its power supply.
The electropumps used to channel toxic fluids must be decontaminated before being repaired.
As soon as the maintenance, inspection or assembly operation is completed, fit the safety and protective devices back in.
Before starting the electropump, follow the directions provided at section 4 and 5, “Installation” and “Start up”.

## SYMBOLS CONTAINED IN THE MANUAL

WARNING AGAINST ELECTRIC RISKS
Safety symbol, as per DIN 4844-W8

GENERAL DANGER SYMBOL
Safety symbol, as per DIN 4844-W9

**WARNING:** THIS WORD IS SPECIFIED BY THE SAFETY REGULATIONS; FAILURE TO COMPLY WITH SUCH WARNING COULD ENDANGER THE MACHINE AND ITS OPERATION.

## Safety.

When installing, servicing and operating the machine, adhere to the basic directions provided by the manual. It is therefore extremely important that the manual be read before the equipment is installed and started by skilled installers and the equipment operator.
The manual should always be kept at hand in the place in which the machine is used.

## Risks deriving from failure to comply with safety rules.

Failure to comply with safety rules could cause substantial damage to people, the environment, the machines, and could lead to forfeiture of the right to claim damages.
The most common risks deriving from failure to comply with safety rules are:
- Damage to important functions of the electropump or equipment.
- Hazardous materials being scattered around.
- No maintenance.
- Injuries to people, caused by mechanic gears, electric or chemical effects.

## Safe operations

For your own and other people's safety, adhere to the safety directions provided by this manual, the national accident-prevention regulations, as well as the company's internal regulations on operation, safety and work.

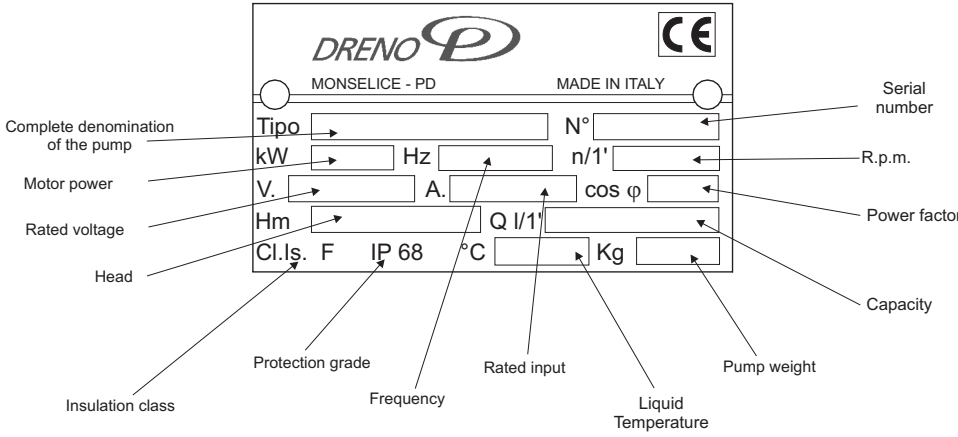
## Alterations and spare parts.

The elctropump may not be changed or altered without the manufacturer's authorisation. To repair the electropump, use only original spare parts, which are key to safety.
If different spare parts are used, we shall not be held liable for any resulting damage.

## Maintenance, inspection, assembly operations.

The equipment operator shall make sure that all maintenance, installation and inspection operations are performed by skilled and authorised staff.
Before working on the electropump, make sure it is off and disconnected from its power supply.
The electropumps used to channel toxic fluids must be decontaminated before being repaired.
As soon as the maintenance, inspection or assembly operation is completed, fit the safety and protective devices back in.
Before starting the electropump, follow the directions provided at section 4 and 5, “Installation” and “Start up”.

# 2. EXPLANATION OF LABEL




# 3.WARRANTY

DRENO POMPE's warranty covers the electropumps and the supplied equipment against faulty quality and material workmanship.
Any part that is found faulty at origin will be repaired or replaced by DRENO POMPE by charging labour costs only.
Any claim for direct or incidental damage shall be rejected. The electropumps and/or the supplied equipment to be repaired or replaced shall be sent, without tampering and carriage free, to DRENO POMPE, Via Umbria, 15 Z.I. MONSELICE (PADOVA).
They will be repaired or replaced and sent back to the customer, carriage forward.
This warranty does not cover those parts that are replaced at regular intervals (such as: impeller, pump body, cable, pipes and the like) since they are prone to quick decay and wear and tear because of their nature and use.
This warranty does not cover damages due to motor overload, failure to use the electropump protective devices, incorrect installation or improper maintenance.
DRENO POMPE's warranty applies, therefore, to the following cases:
- one of our representatives or DRENO POMPE are informed of the fault by the expiry date of the product warranty;
- the fault is due to improper installation, workmanship or material;
- the product has only been used for its intended purposes;
- the product has been repaired or replaced by skilled staff or by DRENO POMPE;
- the in-built protective devices have been properly connected;
- original DRENO POMPE spare parts have been used.

DRENO POMPE guarantees that spare parts will be available for 5 years of discontinuation of the products.
This warranty shall last 24 months (covering manufacturing faults, excluding electric components) of the product delivery date.
DRENO POMPE S.r.l. reserves the right to make changes without notice.

# 4. Service features

The 2/4 poles A-V and 2 poles G and H ranges of “DRENO POMPE” strong submersible electropumps can be used in a wide number of private and industrial applications.

**Max temperature of pumping liquid:** + 40°C with completely submersed unit.

**Max plunging depth:** 20 m

**Min fluid level:** see submersion (Page 10-11 )

**Pumping fluid pH :** 6 - 11

**Fluid density:** not to exceed 1100 kg/m3.

The pumping liquid can contain solid particles up to the diameter allowed by the impeller.
Do not use the electropump when there are risks of explosions or fires or for pumping flammable liquids. For any other use, contact DRENO POMPE S.r.l. for information.

# 5. Technical specifications

## 5.1 Materials

The materials used to manufacture the components have been very carefully selected to ensure high reliability and a long life even in heavy duty conditions.
The parts that compose the 2/4 poles A-V and 2 poles G and H ranges, such as: motor casing, motor housing, bearing housing, pump body and impeller, are made of GG 25 cast iron; the screws, bolts and nuts are AISI 304 and the O-rings are made of nitrile rubber. The motor shaft is AISI 420 steel. The grinding part of the G range is made of hardened steel.

## 5.2 Bearings

These pumps are provided with two lifelong-lubricated maintenance-free bearings (see codes for specifications).

## 5.3 Electric motors

The electric motors are asynchronous, 2-4 poles, single-phase or three-phase, with squirrel-cage rotor.
For 230 V single-phase voltages (±5%, 50 Hz), powers range from 1.1 to 1.5 kW, while for 400V three-phase voltages (±5%, 50 Hz), powers range from 1.1 to 43 kW (60 Hz is available as an option).
These motors have been designed to deliver the highest rated voltage with a variation of up to 5% of the rated voltage.
All stators have been designed with insulation class F (155°C) and protection grade IP 68; they can be withstand fluid temperatures of 40°C.
Single-phase and three-phase windings are fitted with safety micro-thermostats to prevent the motor exceeding the temperature limit of 130°C.
The electric motor is cooled by the same fluid in which the electropump is submersed.
The maximum noise level of our pumps is $\leq$ 70 dB (A), such level can sometimes be reached in special types of installations or workplaces.
A maximum of 15 regularly spaced start-ups/hour are allowed.

## 5.4 Electric cable

The standard power line provided with the pump is 10-metre H07-RN-F.
The HM 50/2/125 C.500, AM-VM 65/2/125 C.236-336, AM-VM 80/4/125 C. 241-242/341-342 and GM 32/2/125 C.150-155 ranges of electropumps with single-phase motor are provided with a small electric control box whereas the three-phase motor are provided with free terminals.

### 5.5 Mechanical seals

The 2/4 poles A-V and 2 poles G and H ranges of electropumps are provided with two mechanical seals to provide perfect insulation between the electric motor and the pumped liquid, and both are lubricated and cooled in the oil chamber.

- Motor-side seal:
For motor size 125/152/173 : Ceramic/Graphite
For motor size 200/240/340 : Highly wear-resistant Silicon carbide + Viton.

- Impeller-side seal:
All motor sizes : Highly wear-resistant Silicon carbide + Viton.

### 5.6 Impellers

The 2/4 poles A-V and 2 poles G and H ranges are all provided with GG 25 cast iron impellers, available in several models:

| | |
|---|---|
| | SINGLE-CHANNEL, OPEN SERIES " A 2 - 4 POLES "<br>Dirty waters from gratings, mechanically cleared dirty waters, industrial waters with solids, dirty waters from waste dumps, rain waters, stirred sludges, dirty industrial waters. |
| | SINGLE-CHANNEL, CLOSED SERIES " A 2 - 4 POLES "<br>Raw dirty waters, flow-by and hot sludge, mixed waters, raw and rotten sludge, stirred sludge. |
| | VORTEX SERIES " V 2-4 POLES "<br>Sewage and dirty waters from gratings, stirred sludge, rotten sludge, mixed waters. |
| | TWO- AND FOUR-CHANNELS, OPEN SERIES " H 2 POLES"<br>Dirty waters from gratings, mechanically cleared dirty waters, rain waters. |
| | IMPELLER WITH GRINDER SERIES " G 2 POLES"<br>Domestic dirty waters, dirty waters with solids and excrements. |

# 6. TECHNICAL DATA

## ELECTROPUMPS AM-T 2 POLES 50Hz SERIES

| TYPE | DN | SOLID PARTICLE PASSAGE | r.p.m | POWER | ABSORPTION | | | CABLE | WEIGHT |
|---|---|---|---|---|---|---|---|---|---|
| | mm | mm | min-1 | Kw | 1 - PHASE | | 3 - PHASES | | |
| | | | | | 230 V | µ F | 400 V | | |
| AM-T 65/2/125 C. 236 | 65 | 40 | 2850 | 1.5 | 11 | 40 | 3.6 | (4) A.D. | 41 |
| AT 65/2/125 C. 237 | 65 | 40 | 2850 | 2.2 | | | 5.3 | (4) A.D. | 42.5 |
| AT 65/2/152 C. 247 | 65 | 45 | 2850 | 4 | | | 8.8 | (4) A.D. | 60 |
| AT 80/2/173 C. 257 | 80 | 55 | 2850 | 7.5 | | | 14.1 | (5) Y-Δ | 87.5 |
| AT 80/2/200 C. 267 | 80 | 33 | 2850 | 12 | | | 23 | (8) Y-Δ | 190 |
| AT 80/2/200 C. 268 | 80 | 33 | 2850 | 15 | | | 29.5 | (8) Y-Δ | 200 |

## ELECTROPUNPS VM-T 2 POLES 50Hz SERIES

| TYPE | DN | SOLID PARTICLE PASSAGE | r.p.m | POWER | ABSORPTION | | | CABLE | WEIGHT |
|---|---|---|---|---|---|---|---|---|---|
| | mm | mm | min-1 | Kw | 1 - PHASE | | 3 - PHASES | | |
| | | | | | 230 V | µ F | 400 V | | |
| VM-T 65/2/125 C. 336 | 65 | 65 | 2850 | 1,5 | 11 | 40 | 3,6 | (4) A.D. | 40 |
| VT 65/2/125 C. 337 | 65 | 65 | 2850 | 2,2 | | | 5,1 | (4) A.D. | 42 |
| VT 65/2/152 C. 346 | 65 | 60 | 2850 | 3 | | | 6,8 | (4) A.D. | 66 |
| VT 65/2/152 C. 347 | 65 | 60 | 2850 | 4 | | | 8,6 | (4) A.D. | 67 |
| VT 80/2/173 C. 354 | 80 | 70 | 2850 | 5,2 | | | 11,5 | (5) Y-Δ | 92 |
| VT 80/2/173 C. 357 | 80 | 70 | 2850 | 7,5 | | | 15,4 | (5) Y-Δ | 94 |
| VT 80/2/200 C. 367 | 80 | 70 | 2850 | 12 | | | 22 | (8) Y-Δ | 185 |
| VT 80/2/200 C. 368 | 80 | 70 | 2850 | 15 | | | 29,5 | (8) Y-Δ | 195 |
| VT 80/2/240 C.369 | 80 | 80 | 2850 | 20 | | | 41 | (8) Y-Δ | 242 |
| VT 80/2/240 C.370 | 80 | 80 | 2850 | 24 | | | 47,5 | (8) Y-Δ | 244 |

## ELECTROPUMPS SERIE GM-T 2 POLES 50Hz SERIES

| TYPE | DN | SOLID PARTICLE PASSAGE | r.p.m | POWER | ABSORPTION | | | CABLE | WEIGHT |
|---|---|---|---|---|---|---|---|---|---|
| | mm | mm | min-1 | Kw | 1 - PHASE | | 3 - PHASES | | |
| | | | | | 230 V | µ F | 400 V | | |
| GM-T 32/2/125 C. 150 | 1"¼ | 6 | 2850 | 1.5 | 10.5 | 45 | 3.5 | (4) A.D. | 38 |
| GM-T 32/2/125 C. 155 | 1"¼ | 6 | 2850 | 1.8 | 12.5 | 45 | 4.1 | (4) A.D. | 37.5 |
| GM-GT 32/2/125 C. 160 | 1"¼ | 6 | 2850 | 2.3 | 16.5 | 55 | 5.5 | (4) A.D. | 40 |
| GT 65/2/152 C. 165 | 65 | 8 | 2850 | 3.2 | | | 7.8 | (4) A.D. | 61 |
| GT 65/2/152 C. 170 | 65 | 8 | 2850 | 4.2 | | | 9.4 | (4) A.D. | 62 |
| GT 65/2/173 C. 175 | 65 | 10 | 2850 | 6.2 | | | 13.7 | (5) Y-Δ | 85 |
| GT 65/2/173 C. 180 | 65 | 10 | 2850 | 7.8 | | | 16.2 | (5) Y-Δ | 86 |

## ELECTROPUMPS SERIE HM-T 2 POLES 50Hz SERIES

| TYPE | DN | SOLID PARTICLE PASSAGE | r.p.m | POWER | ABSORPTION | | | CABLE | WEIGHT |
|---|---|---|---|---|---|---|---|---|---|
| | mm | mm | min-1 | Kw | 1 - PHASE | | 3 - PHASES | | |
| | | | | | 230 V | µ F | 400 V | | |
| HM-T 50/2/125 C. 500 | 2" | 16 | 2850 | 1.5 | 11 | 40 | 3.75 | (4) A.D. | 37 |
| HT 50/2/125 C. 501 | 2" | 16 | 2850 | 2.2 | | | 5.2 | (4) A.D. | 37 |
| HT 65/2/152 C. 502 | 65 | 10 | 2850 | 3.1 | | | 7.4 | (4) A.D. | 54 |
| HT 65/2/152 C. 503 | 65 | 10 | 2850 | 4 | | | 8.8 | (4) A.D. | 54.5 |
| HT 65/2/173 C. 504 | 65 | 10 | 2850 | 5.5 | | | 12.5 | (5) Y-Δ | 80 |
| HT 65/2/173 C. 505 | 65 | 10 | 2850 | 7.5 | | | 15.5 | (5) Y-Δ | 81 |

## ELECTROPUMPS AM-T 4 POLES 50Hz SERIES

| TYPE | DN | SOLID PARTICLE PASSAGE | r.p.m | POWER | ABSORPTION | | | CABLE | WEIGHT |
|---|---|---|---|---|---|---|---|---|---|
| | mm | mm | min-1 | Kw | 1 - PHASE | | 3 - PHASES | | |
| | | | | | 230 V | µ F | 400 V | | |
| AM-T 80/4/125 C. 241 | 80 | 75 | 1450 | 1.1 | 10.5 | 40 | 2.6 | (4) A.D. | 54 |
| AM-T 80/4/125 C. 242 | 80 | 75 | 1450 | 1.25 | 12.5 | 50 | 3.2 | (4) A.D. | 56 |
| AT 80/4/152 C. 243 | 80 | 75 | 1450 | 1.7 | | | 3.9 | (4) A.D. | 67 |
| AT 80/4/152 C. 244 | 80 | 75 | 1450 | 2.2 | | | 5.2 | (4) A.D. | 69 |
| AT 80/4/152 C. 245 | 80 | 75 | 1450 | 3 | | | 7.2 | (4) A.D. | 70 |
| AT 100/4/152 C. 243 | 100 | 90 | 1450 | 1.7 | | | 3.9 | (4) A.D. | 71.5 |
| AT 100/4/152 C. 244 | 100 | 90 | 1450 | 2.2 | | | 5.1 | (4) A.D. | 73.5 |
| AT 100/4/152 C. 245 | 100 | 90 | 1450 | 3 | | | 7 | (4) A.D. | 75 |
| AT 100/4/173 C. 255 | 100 | 90 | 1450 | 4 | | | 9.1 | (5) Y-Δ | 97 |
| AT 100/4/173 C. 256 | 100 | 90 | 1450 | 5.5 | | | 11.5 | (5) Y-Δ | 103 |
| AT 150/4/173 C. 258 | 150 | 100 | 1450 | 7.5 | | | 15.6 | (5) Y-Δ | 122.5 |
| AT 150/4/200 C. 260 | 150 | 80 | 1450 | 10 | | | 21.3 | (8) Y-Δ | 226 |
| AT 150/4/200 C. 263 | 150 | 80 | 1450 | 16.5 | | | 33.2 | (8) Y-Δ | 235 |
| AT 150/4/200 C. 264 | 150 | 110 | 1450 | 12 | | | 23.4 | (8) Y-Δ | 260 |
| AT 150/4/200 C. 265 | 150 | 110 | 1450 | 16 | | | 31.8 | (8) Y-Δ | 272 |
| AT 150/4/240 C. 275 | 150 | 120 | 1450 | 20 | | | 39.7 | (9) Y-Δ | 308 |
| AT 150/4/240 C. 280 | 150 | 120 | 1450 | 25 | | | 47.7 | (9) Y-Δ | 320 |
| AT 150/4/340 C. 285 | 150 | 110 | 1450 | 29.5 | | | 56 | (10) Y-Δ | 550 |
| AT 150/4/340 C. 290 | 150 | 120 | 1450 | 35 | | | 68 | (10) Y-Δ | 585 |
| AT 150/4/340 C. 295 | 150 | 130 | 1450 | 43 | | | 81 | (10) Y-Δ | 590 |

## ELECTROPUMPS VM-T 4 POLES 50Hz SERIES

| TYPE | DN | SOLID PARTICLE PASSAGE | r.p.m | POWER | ABSORPTION | | | CABLE | WEIGHT |
|---|---|---|---|---|---|---|---|---|---|
| | mm | mm | min-1 | Kw | 1 - PHASE | | 3 - PHASES | | |
| | | | | | 230 V | µ F | 400 V | | |
| VM-T 80/4/125 C. 341 | 80 | 75 | 1450 | 1.1 | 10.5 | 40 | 2.6 | (4) A.D. | 40 |
| VM-T 80/4/125 C. 342 | 80 | 75 | 1450 | 1.25 | 12.5 | 50 | 3.2 | (4) A.D. | 42 |
| VT 80/4/152 C. 343 | 80 | 75 | 1450 | 1.7 | | | 3.9 | (4) A.D. | 65 |
| VT 80/4/152 C. 344 | 80 | 75 | 1450 | 2.2 | | | 5.2 | (4) A.D. | 66 |
| VT 80/4/152 C. 345 | 80 | 75 | 1450 | 3 | | | 7.2 | (4) A.D. | 69 |
| VT 100/4/152 C.348 | 100 | 80 | 1450 | 1.7 | | | 3.9 | (4) A.D. | 70 |
| VT 100/4/152 C. 349 | 100 | 80 | 1450 | 2.2 | | | 5.2 | (4) A.D. | 71 |
| VT 100/4/152 C. 350 | 100 | 80 | 1450 | 3 | | | 7.2 | (4) A.D. | 74 |
| VT 100/4/173 C. 355 | 100 | 90 | 1450 | 4 | | | 9.2 | (5) Y-Δ | 95 |
| VT 100/4/173 C. 356 | 100 | 90 | 1450 | 6 | | | 12.5 | (5) Y-Δ | 99 |
| VT 100/4/173 C. 358 | 100 | 90 | 1450 | 7.5 | | | 15.5 | (8) Y-Δ | 125 |
| VT 100/4/200 C. 362 | 100 | 90 | 1450 | 12 | | | 23.8 | (8) Y-Δ | 196 |
| VT 100/4/200 C. 363 | 100 | 90 | 1450 | 15 | | | 30.4 | (8) Y-Δ | 205 |
| VT 100/4/240 C. 375 | 100 | 90 | 1450 | 20 | | | 41 | (9) Y-Δ | 288 |
| VT 100/4/240 C. 380 | 100 | 90 | 1450 | 25 | | | 50.8 | (9) Y-Δ | 295 |
| VT 150/4/340 C. 385 | 150 | 130 | 1450 | 35 | | | 68 | (10) Y-Δ | 530 |
| VT 150/4/340 C. 390 | 150 | 130 | 1450 | 45 | | | 85.1 | (10) Y-Δ | 570 |
| VT 150/4/340 C. 395 | 150 | 130 | 1450 | 50 | | | 91.5 | (10) Y-Δ | 585 |

**4 =** Cable H07RN-F 7x1.5 Ø 15 mm Length : 10 MT
**5 =** Cable H07RN-F 10x1.5 Ø 20 mm Length : 10 MT
**8 =** Cable H07RN-F 10x2.5 Ø 23 mm Lungth : 10 MT

**9 =** Cable H07RN-F 7x4 + 3x1 Ø 20.5 mm
**10=** Cable H07RN-F 7x10 + 5x1 Ø 29 mm

# 7. INSTALLATION

**N.B.** :Before assembly or start-up, skilled staff shall read the instructions and keep them always at hand on the installation site.

**7.1 Safety rules**

For your safety during the installation, operation or maintenance of the electropump, adhere to the following rules:

A) It is extremely important that the electropump be installed by skilled staff;

B) Do not neglect health risks and adhere to hygiene rules;

C) The staff working at dirty water pumping stations shall be vaccinated against diseases that could be transmitted through wounds, contact or inhalation;

D) To prevent the skin touching contaminated fluids, wear suitable clothes and shoes. In addition, use a sling, a safety rope, a protective helmet, safety goggles as well as a gas mask if required;

E) Do not neglect drowning risks. Never work alone; even in optimum conditions, there should always be another operator outside the tank;

F) Fence off the work area with barriers and suitable signs, especially if it is a trafficed area;

G) Make sure the lifting/lowering means are sufficent and that you can evacuate the sump quickly in anemergency;

H) Make sure the tank contains an adequate amount of oxygen and no toxic gases;

I) Before working at the lifting station, check very carefully that all power lines contained in the tank have been cut off from their supply. For more information, apply the national provisions provided by the local Power Board;

L) Check that there is no risk of explosion before welding or before any operation involving flames and sparks;

M) If any part of the machinery, either because hot or for any other reason, could pose a risk, take measures to prevent contact between it and the equipment operator;

N) Carefully adhere to the general technical rules concerning industrial safety in closed environments and purification plants.

- Use of this user's manual will not replace or void the general standard rules that it does not contain. All general good practice and technical safety rules should be adhered to.

## 7.2 Rules for a correct installation

Carefully follow all regulations on the use of electropumps in sewerage applications.

Before installation, check that the cable and electropump have not been damaged during transport.
For safe installation, make sure the foundation cement has set well, that the surface is level and the foundation is strong enough (min. B 25 as per DIN 1045), as per DIN 1045 and equivalent standards.
Before installing the electropump, check that the specifications shown on the plate match those of the equipment (frequency, voltage, liquid temperature).

### 7.2.1 Rules for a proper installation

Never install the electropump where it could come into contact with inexperienced staff (such as open tanks or wells, pools, etc.).

For the pump to work efficiently, follow the recommendations below:
- Suitably protect the electric equipment installed outside the pit from weather and gas seeping from the pit.
- The size of the collection chamber shall be adequate to fulfil at least the usable liquid volume, to reduce the number of start-ups/hour.
- When stationary, no hard sediments should build up.
- The pump suction collar should be placed in the lowest point of the chamber.
- Arrival of fluid to the collection chamber is essential. It should not create such disturbance as to cause the electropump to take in air, which would reduce the pump efficiency.

### *7.2.2 Delivery piping*

Install the delivery piping in compliance with the applicable regulations. For areas subject to DIN 1986 standards, follow the rules below:
- Equip the delivery piping with an anti-backup trap (180° curve), placing it above the backup level, and letting the fluid flow by gravity to the sewerage duct.
- Do not connect the delivery pipe to a pressurised duct.
- Protect the delivery piping from frost.
- The delivery piping should not clog. To prevent this, the speed should be adequate to the type of pumped liquid.

Use cast-iron valves suitable for wastewater. In terms of manufacture, ball check valves and flat-body gate valves are preferable.
If the delivery manifold is long, fit a check valve (always install it in horizontal stretches or in places in which sediments do not build up) to prevent the back flow, when stopping the pump, being close to the usable volume of the collection trap. In this case, the pump should undergo a high number of start-ups/hour.

WARNING : Do not use the pump as a fixed piping point. Bear in mind that the pipes could be subject to thermal expansion; take measures to avoid submitting the pump to stresses and movements that the pipes cannot withstand.

### *7.2.3 Electrical connections*

Electrical connections should be performed by qualified staff in accordance with the applicable regulations.

WARNING : Do not remove the guard of the power line before performing the electrical connections.
If, for any reason, the cable should be shortened, take note of the wire numbers (1,2,3...10), colours or marks at the ends (U1,V1,W1,W2,U2,V2,S,T1 T2) which have to be correctly fitted back after shortening the line.

When the installation is completed, the power line should be secured at high level, to prevent it from being sucked in by the pump.

N.B. For pumping stations, comply with VDE 0190 standards (on the installation of piping and protective devices in electric equipment).

If installed in swimming-pools, gardens and other outdoor applications, adhere to the Standard European regulations or contact qualified staff.

### *7.2.4 Overload protection.*

Protect the motor of the electropump from overloads through a delayed thermal device, VDE 0660/ICE 947, in accordance with the applicable national regulations.

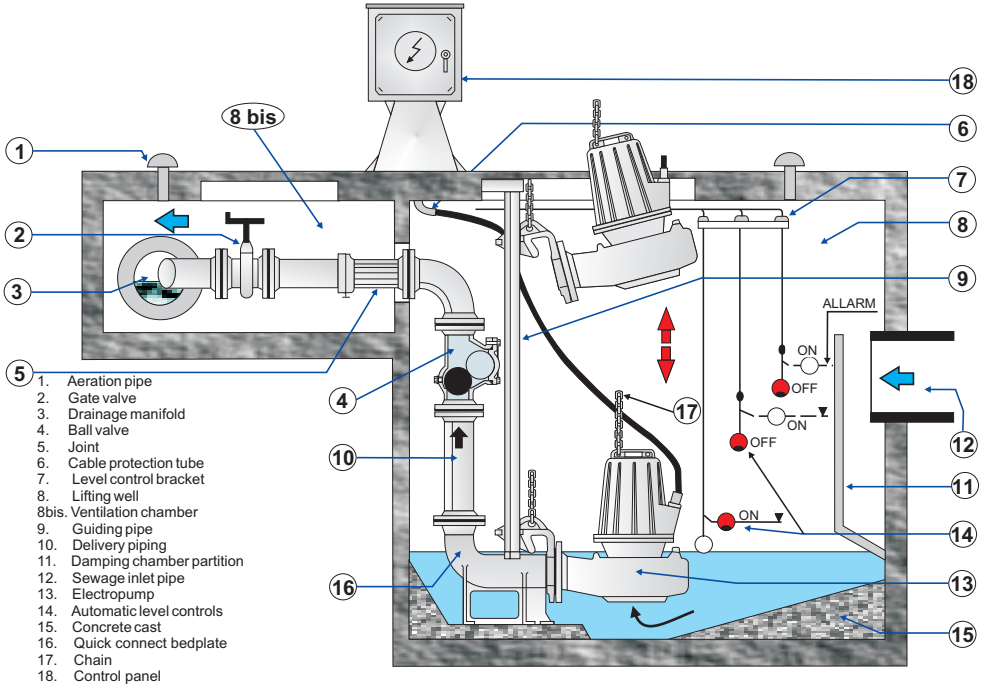
### *7.2.5 Level switch*

WARNING: In automatically-operated stations, the level switch shall be installed in such a way that the lower stopping point matches the values specified at section 11 (“Dimensions”) to prevent the pump working without liquids.

## 8. Start-up

Before starting the electropump, carefully check that:
- The electric connections comply with the applicable regulations.
- The conductivity sensor and the thermal probe have been properly connected.
- The pump has been properly secured to the base block.
- The direction of rotation of the pump is correct, even when the generating unit starts working.
- The level controls have been properly connected.
- The ball check valve is open in the right direction.

# 9. PROPER INSTALLATION

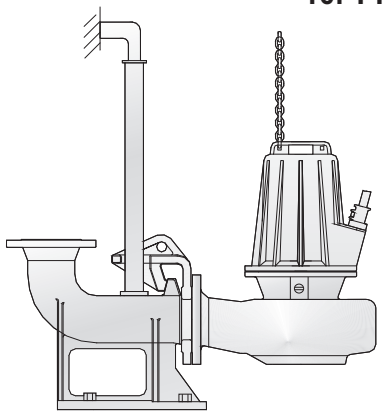


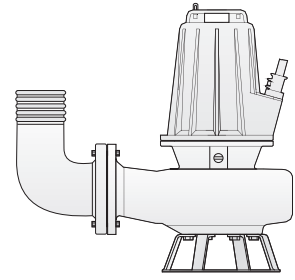

1. Aeration pipe
2. Gate valve
3. Drainage manifold
4. Ball valve
5. Joint
6. Cable protection tube
7. Level control bracket
8. Lifting well

8bis. Ventilation chamber

9. Guiding pipe
10. Delivery piping
11. Damping chamber partition
12. Sewage inlet pipe
13. Electropump
14. Automatic level controls
15. Concrete cast
16. Quick connect bedplate
17. Chain
18. Control panel

# 10. TYPES OF INSTALLATION





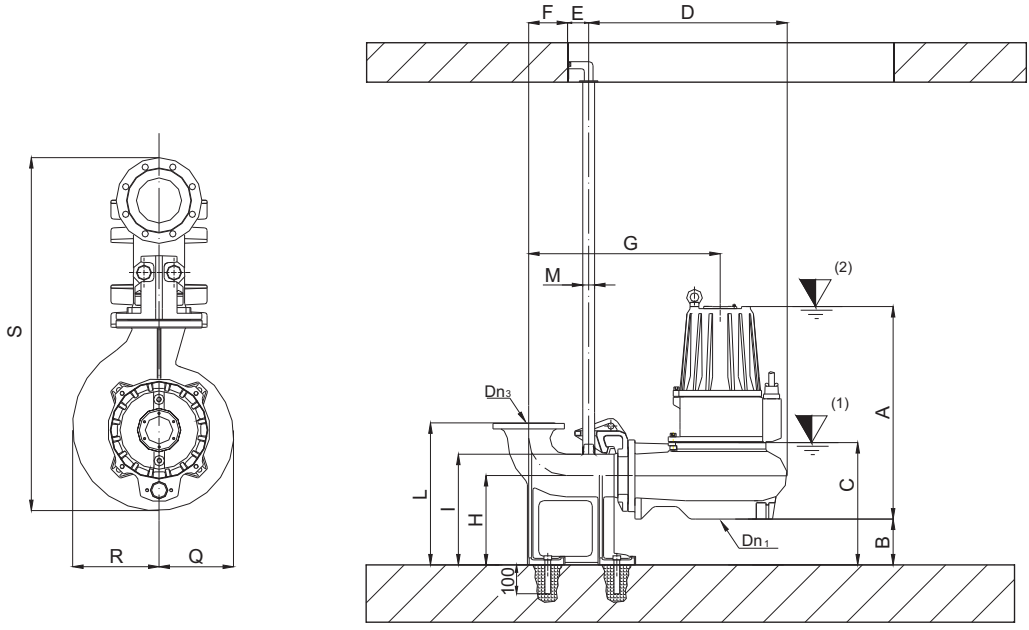
## 10.1 FIXED SUBMERGED INSTALLATION WITH QUICK COUPLING SYSTEM

The fixed submersed installation that utilises a coupling system based on two guiding pipes provides automatic connection between the electropump and the foot, i.e. to the drainage manifold, thus ensuring perfect sealing properties due to the weight of the electropump.
The electropump can be easily removed for inspection or maintenance without having to enter the well.

## 10.2 MOBILE SUBMERGED INSTALLATION

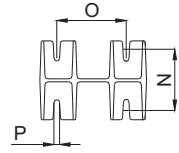
For quick, mobile use, even in the event of an emergency or for assistance.

# 11.OVERALL DIMENSIONS FOR STATIONARY INSTALLATION




(1) Lowest shut-off point for automatic operation

(2) Minimun covering for continuous operation




| TIPO | DN1 | DN3 | A | B | C | D | E | F | G | H | I | L | M | N | O | P | Q | R | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM-T 65/2/125 C. 236-237 | 65 | 65 | 416 | 71 | 203 | 423 | 55 | 86 | 444 | 137 | 178 | 303 | 1"¼ | 135 | 150 | 14 | 103 | 115 | 659 |
| AT 65/2/152 C. 247 | 65 | 65 | 467 | 67 | 200 | 470 | 55 | 86 | 475 | 137 | 178 | 303 | 1"¼ | 135 | 150 | 14 | 123 | 123 | 705 |
| AT 80/2/173 C. 257 | 80 | 80 | 528 | 80 | 230 | 512 | 80 | 86 | 522 | 180 | 228 | 362 | 2" | 165 | 190 | 18 | 138 | 138 | 777 |
| AT 80/2/200 C. 267-268 | 150 | 80 | 700 | 71 | 269 | 632 | 80 | 86 | 579 | 180 | 228 | 362 | 2" | 165 | 190 | 18 | 183 | 183 | 897 |

| TIPO | DN1 | DN3 | A | B | C | D | E | F | G | H | I | L | M | N | O | P | Q | R | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VM-T 65/2/125 C. 336-337 | 65 | 65 | 416 | 71 | 203 | 423 | 55 | 86 | 444 | 137 | 178 | 303 | 1"¼ | 135 | 150 | 14 | 103 | 115 | 659 |
| VT 65/2/152 C. 346-347 | 65 | 65 | 467 | 67 | 200 | 470 | 55 | 86 | 475 | 137 | 178 | 303 | 1"¼ | 135 | 150 | 14 | 123 | 123 | 705 |
| VT 80/2/173 C. 354-357 | 80 | 80 | 528 | 80 | 230 | 512 | 80 | 86 | 522 | 180 | 228 | 362 | 2" | 165 | 190 | 18 | 138 | 138 | 777 |
| VT 80/2/200 C. 367-368 | 150 | 80 | 700 | 71 | 269 | 632 | 80 | 86 | 579 | 180 | 228 | 362 | 2" | 165 | 190 | 18 | 183 | 183 | 897 |
| VT 80/2/240 C. 369-370 | 150 | 80 | 744 | 71 | 292 | 657 | 80 | 86 | 579 | 180 | 228 | 362 | 2" | 165 | 190 | 18 | 183 | 183 | 920 |

| TIPO | DN1 | DN3 | A | B | C | D | E | F | G | H | I | L | M | N | O | P | Q | R | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GM-T 32/2/125 C. 150-155-160 | | 2" | 365 | 86 | 161 | / | / | / | / | 135 | / | / | 1"¼ | 55 | 170 | 18 | 105 | 103 | 430 |
| GT 65/2/152 C. 165-170 | 65 | 65 | 430 | 68 | 170 | 460 | 55 | 86 | 465 | 137 | 178 | 303 | 1"¼ | 135 | 150 | 14 | 129 | 124 | 695 |
| GT 65/2/173 C. 175-180 | 65 | 65 | 480 | 66 | 165 | 484 | 55 | 86 | 470 | 137 | 178 | 303 | 1"¼ | 135 | 150 | 14 | 138 | 138 | 720 |

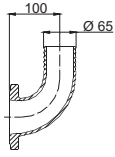
| TIPO | DN1 | DN3 | A | B | C | D | E | F | G | H | I | L | M | N | O | P | Q | R | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HM-T 50/2/125 C. 500-501 | | 2" | 371 | 93 | 178 | / | / | / | / | 135 | / | / | 1"¼ | 55 | 170 | 18 | 103 | 109 | 460 |
| HT 65/2/152 C. 502-503 | 65 | 65 | 435 | 71 | 170 | 458 | 55 | 86 | 465 | 137 | 178 | 303 | 1"¼ | 135 | 150 | 14 | 125 | 123 | 695 |
| HT 65/2/173 C. 504-505 | 65 | 65 | 487 | 69 | 176 | 482 | 55 | 86 | 468 | 137 | 178 | 303 | 1"¼ | 135 | 150 | 14 | 138 | 138 | 717 |

| TYPE | DN1 | DN3 | A | B | C | D | E | F | G | H | I | L | M | N | O | P | Q | R | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM-T 80/4/125 C. 241-242 | 80 | 80 | 441 | 82 | 239 | 545 | 80 | 86 | 555 | 180 | 228 | 362 | 2" | 165 | 190 | 18 | 143 | 166 | 810 |
| AT 80/4/152 C. 243-244-245 | 80 | 80 | 479 | 80 | 227 | 552 | 80 | 86 | 555 | 180 | 228 | 362 | 2" | 165 | 190 | 18 | 146 | 177 | 818 |
| AT 100/4/152 C. 243-244-245 | 100 | 100 | 486 | 95 | 249 | 549 | 80 | 125 | 592 | 205 | 265 | 400 | 2" | 200 | 250 | 24 | 149 | 189 | 864 |
| AT 100/4/173 C. 255-256 | 100 | 100 | 550 | 93 | 271 | 594 | 80 | 125 | 616 | 205 | 265 | 400 | 2" | 200 | 250 | 24 | 168 | 207 | 910 |
| AT 150/4/173 C. 258 | 150 | 150 | 595 | 114 | 337 | 686 | 80 | 160 | 706 | 256 | 349 | 472 | 2" | 240 | 282 | 24 | 192 | 240 | 1068 |
| AT 150/4/200 C. 260-263 | 150 | 150 | 723 | 280 | 500 | 720 | 80 | 160 | 733 | 420 | 510 | 630 | 2" | 240 | 282 | 24 | 208 | 247 | 1102 |
| AT 150/4/200 C. 264-265 | 150 | 150 | 806 | 245 | 575 | 799 | 80 | 160 | 768 | 420 | 510 | 630 | 2" | 240 | 282 | 24 | 246 | 290 | 1181 |
| AT 150/4/240 C. 275-280 | 150 | 150 | 847 | 245 | 575 | 799 | 80 | 160 | 768 | 420 | 510 | 630 | 2" | 240 | 282 | 24 | 246 | 290 | 1181 |
| AT 150/4/340 C. 285-290-295 | 150 | 150 | 1040 | 225 | 595 | 998 | 80 | 160 | 900 | 420 | 510 | 630 | 2" | 240 | 282 | 24 | 285 | 320 | 1380 |

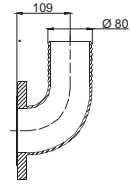
| TYPE | DN1 | DN3 | A | B | C | D | E | F | G | H | I | L | M | N | O | P | Q | R | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VM-T 80/4/125 C. 341-342 | 80 | 80 | 456 | 80 | 252 | 470 | 80 | 86 | 489 | 180 | 228 | 362 | 2" | 165 | 190 | 18 | 144 | 148 | 735 |
| VT 80/4/152 C. 343-344-345 | 80 | 80 | 520 | 80 | 258 | 530 | 80 | 86 | 539 | 180 | 228 | 362 | 2" | 165 | 190 | 18 | 148 | 165 | 800 |
| VT 100/4/152 C. 348-349-350 | 100 | 100 | 540 | 95 | 286 | 546 | 80 | 125 | 576 | 205 | 265 | 400 | 2" | 200 | 250 | 24 | 148 | 170 | 864 |
| VT 100/4/173 C. 355-356-358 | 100 | 100 | 593 | 93 | 321 | 614 | 80 | 125 | 625 | 205 | 265 | 400 | 2" | 200 | 250 | 24 | 177 | 202 | 927 |
| VT 100/4/200 C. 362-363 | 100 | 100 | 730 | 92 | 335 | 618 | 80 | 125 | 605 | 205 | 265 | 400 | 2" | 200 | 250 | 24 | 183 | 202 | 932 |
| VT 100/4/240 C. 375-380 | 150 | 100 | 806 | 60 | 346 | 738 | 80 | 125 | 689 | 205 | 265 | 400 | 2" | 200 | 250 | 24 | 237 | 270 | 1050 |
| VT 150/4/340 C. 385-390-395 | 150 | 150 | 1040 | 225 | 595 | 998 | 80 | 160 | 900 | 420 | 510 | 630 | 2" | 240 | 282 | 24 | 285 | 320 | 1380 |

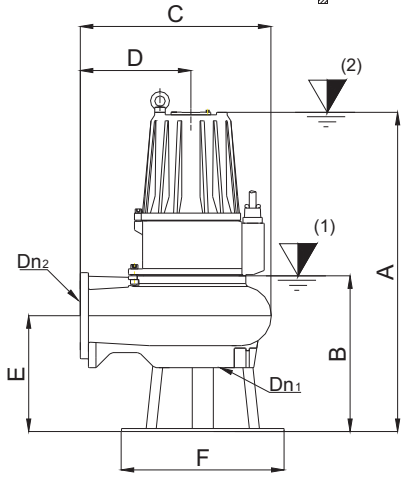
# 12. OVERALL DIMENSIONS FOR MOBILE INSTALLATION

DN 65 PN 6

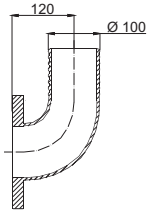



DN 80 Pn16

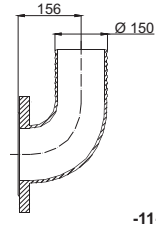



DN 100 PN 16




DN 150 PN 16




| TYPE | DN1 | DN2 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|
| AM/AT 65/2/125 C. 236-237 | 65 | 65 | 481 | 197 | 294 | 174 | 132 | 260 |
| AT 65/2/152 C.247 | 65 | 65 | 532 | 197 | 340 | 205 | 135 | 260 |
| AT 80/2/173 C.257 | 80 | 80 | 608 | 230 | 368 | 213 | 180 | 320 |
| AT 80/2/200 C.267-268 | 150 | 80 | 825 | 346 | 488 | 270 | 234 | 420 |

| TYPE | DN1 | DN2 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|
| VM-T 65/2/125 C. 336-337 | 65 | 65 | 481 | 197 | 294 | 174 | 132 | 260 |
| VT 65/2/152 C. 346-347 | 65 | 65 | 532 | 197 | 340 | 205 | 135 | 260 |
| VT 80/2/173 C. 354-357 | 80 | 80 | 608 | 230 | 368 | 213 | 180 | 320 |
| VT 80/2/200 C. 367-368 | 150 | 80 | 825 | 346 | 488 | 270 | 234 | 420 |
| VT 80/2/240 C. 369-370 | 150 | 80 | 870 | 348 | 514 | 270 | 234 | 420 |

| TYPE | DN1 | DN2 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|
| GM-T 32/2/125 C.150-155-160 | | 1"¼ | 415 | 125 | 260 | 140 | 94 | 206 |
| GT 65/2/152 C. 165-170 | 65 | 65 | 496 | 168 | 330 | 194 | 135 | 260 |
| GT 65/2/173 C. 175-180 | 65 | 65 | 556 | 170 | 355 | 200 | 141 | 275 |

| TYPE | DN1 | DN2 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|
| HM-T 50/2/125 C. 500-501 | | 2" | 436 | 152 | 290 | 170 | 102 | 260 |
| HT 65/2/152 C. 502-503 | 65 | 65 | 500 | 165 | 329 | 194 | 132 | 260 |
| HT 65/2/173 C. 504-505 | 65 | 65 | 552 | 172 | 353 | 198 | 132 | 260 |

| TYPE | DN1 | DN2 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|
| AM-T 80/4/125 C. 241-242 | 80 | 80 | 521 | 237 | 400 | 246 | 178 | 320 |
| AT 80/4/152 C. 243-244-245 | 80 | 80 | 559 | 227 | 408 | 245 | 180 | 320 |
| AT 100/4/152 C. 243-244-245 | 100 | 100 | 586 | 255 | 405 | 242 | 210 | 370 |
| AT 100/4/173 C. 255-256 | 100 | 100 | 650 | 278 | 450 | 266 | 212 | 370 |
| AT 150/4/173 C. 258 | 150 | 150 | 720 | 348 | 528 | 309 | 267 | 420 |
| AT 150/4/200 C. 260-263 | 150 | 150 | 848 | 347 | 562 | 336 | 266 | 420 |
| AT 150/4/200 C. 264-265 | 150 | 150 | 956 | 480 | 641 | 370 | 325 | 500 |
| AT 150/4/240 C. 275-280 | 150 | 150 | 997 | 480 | 641 | 370 | 325 | 500 |
| AT 150/4/340 C. 285-290-295 | 150 | 150 | 1190 | 520 | 840 | 503 | 345 | 500 |

| TYPE | DN1 | DN2 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|
| VM-T 80/4/125 C. 341-342 | | 80 | 456 | 172 | 326 | 180 | 100 | / |
| VT 80/4/152 C.343-344-345 | 80 | 80 | 605 | 264 | 387 | 230 | 185 | 320 |
| VT 100/4/152 C.348-349-350 | 100 | 100 | 640 | 298 | 405 | 230 | 210 | 370 |
| VT 100/4/173 C.355-356-358 | 100 | 100 | 693 | 327 | 470 | 278 | 218 | 370 |
| VT 100/4/200 C. 362-363 | 100 | 100 | 855 | 370 | 473 | 255 | 238 | 420 |
| VT 100/4/240 C. 375-380 | 150 | 100 | 931 | 412 | 594 | 342 | 266 | 420 |
| VT 150/4/340 C.385-390-395 | 150 | 150 | 1190 | 520 | 840 | 503 | 345 | 500 |

## 13. ELECTRICAL CONNECTIONS

All electrical connections should be performed by qualified electricians.
The network frequency and voltage must match those shown on the pump plate.

.

Before opening the electropump, disconnect it from its power supply.

To enter the connection area, loosen the Allen screws that secure the motor casing to the motor housing.

-For electric connections, see the diagrams.

-In three-phase motors, check the direction of rotation of the impeller (see section 15, “Direction of rotation”).

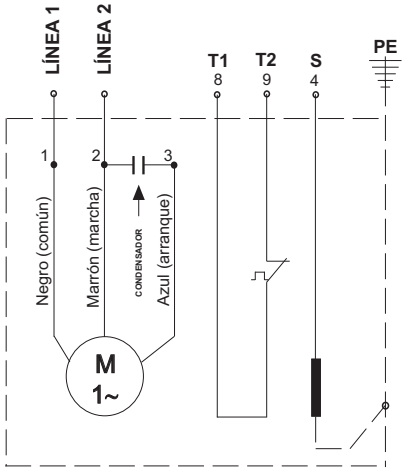
-Never force the pump to work without first investigating and correcting the cause of its failure.

-To prevent water seeping into the pump, when fitting the cable back in, always use a new gasket (cable entry gland) and make sure the cable gland is tight.

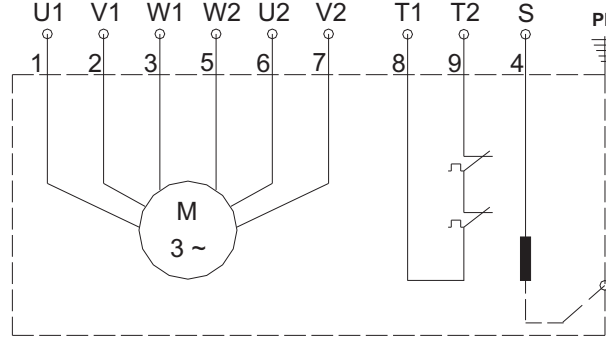
Protect all electric connections from humidity. All joints must be perfectly watertight when submersed.

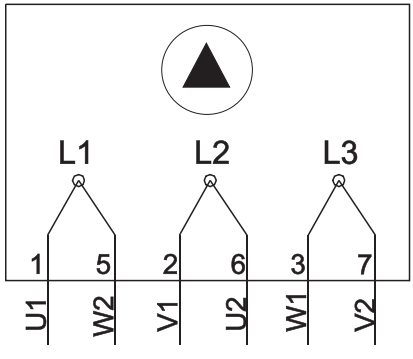
## 14. ELECTRICAL DIAGRAMS

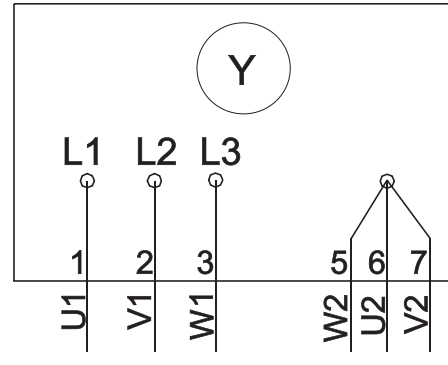
**Single-phase 230 V**



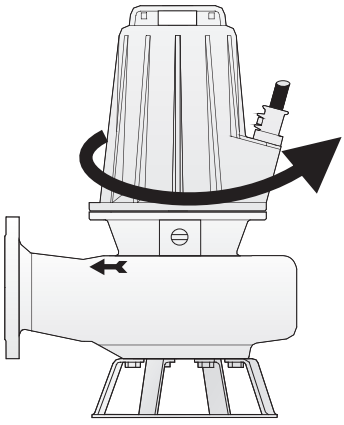

**D.O.L. 400 V**
**Y / Δ**



## 15. Kick back at start up



**Direction of rotation** (three-phase pumps only)

After any new connection, phase or voltage failure, the phases could be inverted, so the direction of rotation has to be checked. An incorrect direction of rotation would cause the motor to overheat, cause strong vibrations and markebly reduce the pump flow rate.
To check the direction of rotation of the rotor, slightly bend the pump and start it.

Stand away from the impeller when starting the pump.
Be careful with the kick back at start up since it can be dangerous, and make sure no staff can be injured during rotation.

If, when started, the pump recoils anticlockwise (as seen from above), the connection is correct; otherwise, disconnect the pump from its power supply and invert the two phases.
When seen from below (from the suction collar), the correct rotation of the impeller is anticlockwise.

## 16. MOTOR PROTECTION

The 2/4 poles A-V, 2 poles G and H ranges of submersible pumps are equipped with thermal detectors in their windings, which promptly warn and stop the pump when the motor overheats. This safety device is normally closed and opens at a temperature of 130°C, thereby cutting out the pump from its power supply, and closes back only when the temperature reaches 75°C.
In addition, the 2/4 poles A-V, 2 poles G and H ranges of submersible pumps are provided with a sealing control electrode. A sensor in the oil chamber promptly detects any liquid seeping through the sealing gears.
Such device checks, therefore, the mechanical seal on the impeller side for efficiency. When it detects pumped liquid in the oil chamber, it sends out a visual or sound signal on the power board.
Depending on the type of control panel, the pumps can resume working after cooling down.

## 17. OPERATING RULES

### 17.1 TRANSPORT

WARNING : During transport, the pump must not be hit or suddenly dropped.
Never use the power line for lifting the electropump; use the special hooks provided.

Any pump-handling device must be adequate to the weight of the unit and comply with the applicable safety regulations.

If the pump has to be moved or opened for safety purposes, it should be disconnected from its power supply.

### 17.2 BELOW ZERO TEMPERATURES

The pump does not freeze when operating or submersed. If the pump is pulled out of water, and therefore exposed to temperatures below zero, the impeller could be jammed with frost. If the impeller is jammed with frost, soak the pump again until it thaws out.

**WARNING :** do not use quicker methods, for instance heating it up, which could damage the machine.

### 17.3 CLEANING

When using a mobile model, the pump should be cleaned after each service with a jet of clean water to prevent sediments and scales building up. If the pump is stationary, check the automatic level switches at regular intervals. Manually operate the switch and drain the well. Remove any residues from the float. After cleaning, the well should be washed by letting in clean water and simulating a few automatic start/stop cycles.

## 17.4 PUMP BODY BREATHER PIPE

When plunging a pump in a well full of water, vacuum may form inside the pump body which could interfere with the pumping. In this case, pull the pump out of the pumping liquid and plunge it in again; repeat if required.

## 17.5 STORAGE

**17.5.1 Storage of new pumps.**

- Place the pump vertical, in a cool and dry place.
- Place the cable in a place where it cannot be damaged.
- Spray oil inside the pump body.

**17.5.2 Removal and storage.**

Before storing the pump, service it as described at section 16 “Inspection and Maintenance”.
Then, store the pump as described in the section “Storage of new pumps”.

**17.5.3 If the pump is in place, ready to work.**

If the electropump is not used for a long time, make it run at least once a month for about one minute. Before doing this, pour an adequate amount of liquid inside the tank (see submergence, on page 10-11).

**17.5.4 Operations during storage.**

When the pump is stored, turn the impeller by hand (at least once every two months) to prevent the seals getting stuck together. If the electropump is not used for over six months, this rotation is compulsory.

WARNING : Before using the pump, inspect it as described in the section “Recommended inspections”

## 18. INSPECTION AND MAINTENANCE

The customer shall supervise all works (inspection, check, assembly) to make sure they are performed by skilled staff in compliance with the applicable regulations.

### For your safety, during a simple inspection.

Make sure the pump is disconnected from the power supply so that it cannot start, even accidentally, before working on it.

For your personal hygiene, make sure the pump has been thoroughly washed with water and specific products. Especially if the pump has worked with toxic fluids.
When changing oil, take care not to endanger people or the environment.

N.B. If the electropump is disassembled, handle the parts with safety gloves, mask and a waterproof apron.

## 18.1 RECOMMENDED INSPECTIONS

Regular inspection and preventative maintenance ensure a safer and longer operation.

WARNING : If the pump is new or its mechanical parts have been replaced, it should be inspected after one week of operation.

The pump should be regularly inspected after 2,000 hours of operation or at least once a year.
If the pump is used in heavy-duty conditions, inspect it at more frequent intervals.

The points below are subject to standard inspection:

| INSPECTED AREA | REPAIR |
|---|---|
| ***External parts of the pump and installation*** | Replace worn or damaged parts. Tighten all screws and nuts. Check that all guiding pipes are perfectly vertical and the foot is properly secured. |
| ***Pump body and impeller*** | Replace damaged parts (when these two parts of the pump are worn out, the efficiency of the pump automatically decreases). A worn flange in the pump body due to improper installation often causes the coupling end to wear out accordingly, so that they need to be replaced. |
| ***Oil level*** | In case of leaks from the seal, the oil chamber can be under pressure; be careful and protect yourself from sprays (For oil amounts and filling methods, see section 20 “Oil replacement”). |
| ***State of oil*** | Check the colour of the oil. If some water has seeped into the chamber, the oil will look grey or whitish. In this case, replace it and check it again one week later. If you see a lot of water or the oil is very emulsified, replace the lower seal (See section 19.2 "Seal replacement") |
| ***Cable inlet*** | In case of seepage through the cable inlet:<br>check that the screws of the cable entry gland are tight.<br>–replace the cable entry gland . |
| ***Power line*** | If the cable is swollen or its insulating sheath is damaged, replace the cable. Make sure the cable is not compressed as to be prone to breaking or wear and tear. |
| ***Direction of rotation (see Section 10)*** | |
| ***Check motor insulation as well (see Section 9)*** | |

The servicing recommendations described herein are not to be considered as directions on DIY repairs, since specific technical skills are essential.

**Comment of the law on the maintenance of the Pumping and Lifting Station, as per DIN 1986, Part 31**

- Inspect the pumping station once a month and check its operation.
- Pursuant to DIN standards, maintenance on the lifting station shall be performed by skilled staff at regular intervals, as described below:
- Commercial areas - every 3 months.
- Flats - every 6 months.
- Households - once a year.
- Contact a specialist company for standard inspections.

# 19. REPLACEMENT OF WORN PARTS

## 19.1 REPLACEMENT OF THE IMPELLER

Before replacing worn parts, disconnect the pump from its power supply.

Worn impellers often have very sharp edges.

Rest the pump on one side.
Loosen the screws that secure the pump body to the motor unit, remove the pump body.
Loosen the impeller screws, then remove it.

Before fitting in the new impeller, make sure the end of the shaft is clean and faultless.
Now, you can fit in the new impeller (be careful with the position of the key) and secure it with its screw.
Make sure the impeller is properly secured and that it can be easily turned by hand. Clean and oil all sealing surfaces and O-rings.
Now, you can fit the motor unit back on the pump body (install the pump body with its outlet placed 180° from the cable entry gland base).

### 19.2 SEAL REPLACEMENT

This range of electropumps is supplied with two mechanical seals:

- Motor-side mechanical seal;
- Impeller-side mechanical seal;

Both seals are made up of two pieces, a revolving part and a fixed ring.
Before fitting in the new seals, make sure the contact faces are not damaged.

#### 19.2.1 Replacement of impeller-side mechanical seal.

A) Drain the oil chamber for seal lubrication (as described at section 20 “Oil replacement”).

B) Before replacing the mechanical seal, remove the impeller as described in the section above.

C) Using two slot-headed screwdrivers, pull out the old seal, prising first on the revolving part, then on the fixed ring.

D) Before fitting in a new seal, make sure the housings are clean, with no burrs or scorings which could damage the seal or in any case reduce the shaft sealing efficiency.

E) Wet both parts of the seal with a mixture of soap and water for ease of fitting.

**WARNING:** To push the fixed ring into its housing, use a bushing (same diameter as the shafting) to avoid any jamming which could damage the fixed ring. Then, fit in the revolving part.

F) Now, fit in and secure the impeller and close everything again.

#### 19.2.2 Replacement of motor-side mechanical seal.

A) Remove the impeller-side mechanical seal as described in the section above.

B) Remove the motor holder by removing the screws that secure it to the motor casing.

C) Remove the circlip that keeps the seal pressed.

D) Remove the seal.

E) Replace the new seal as described in the section above.

## 20. OIL REPLACEMENT

The oil used to refill the chamber of our electropumps is ecological, non-toxic, tasteless and colourless.

Change the oil :

- When at a simple inspection you find that it is mixed with other liquids.
- At overhaul.
- After 2,000 hours of operation or in any case once a year.

To replace oil:

- Turn the pump upside down while keeping the oil plug turned upwards.

Unscrew the plug.

In case of seepage through the seal, the oil tank could be under pressure; be very careful and protect yourself from sprays.
Take care not to endanger people or the environment when replacing oil, especially if the pump has worked with toxic fluids.

Slowly turn the pump to let all the oil flow out of the tank (let it drip for a few minutes).

- Wash the chamber inside with washing oil.
-To refill oil, place the pump so that the plug is turned upwards.
-Fill the chamber with non-toxic, tasteless and odourless paraffin oil. (Marcol 82, ESSO, Pharma 19 or similar).
- The chamber is full when the oil level is 20 mm below the oil plug thread.
- Before screwing back the screw plug, check the gasket and replace if required.
Now, the pump can be dropped into the well.

Follow the applicable regulations on waste oil disposal.
No oil from the chamber must contaminate the pumped fluid (for instance drinkable water) as per applicable regulations.

| SERIE | QUANTITE DE L'HUILE DANS LE BAC | |
|---|---|---|
| GM-T 32/2/125 C. 150-155-160 | ℓ | 0,65 |
| GT 65/2/152 C. 165-170 | ℓ | 0,8 |
| GT 65/2/173 C. 175-180 | ℓ | 1,3 |
| AM-T 65/2/125 C. 236-237<br>VM-T 65/2/125 C. 336-337<br>HM-T 50/2/125 C. 500-501 | ℓ | 0,6 |
| AT 65/2/152 C.247<br>AT 65/2/152 C.346-347<br>HT 65/2/152 C.502-503 | ℓ | 0,75 |
| AT 80/2/173 C.257<br>VT 80/2/173 C.354-357<br>HT 65/2/173 C.504-505 | ℓ | 1,3 |
| AM-T 80/4/125 C.241-242<br>VM-T 80/4/125 C.341-342 | ℓ | 0,6 |
| AT 80-100/4/152 C.243-244-245<br>VT 80-100/4/152 C.343-344-345-349-350 | ℓ | 0,7 |
| AT 100/4/173 C.255-256<br>VT 100/4/173 C.355-356-358<br>AT 150/4/173 C.258 | ℓ | 1.45 |
| AT - VT 80/2/200 C.267-268 / 367-368<br>VT 100/4/200 C.362-363<br>AT 150/4/200 C.260-263 / 264-265 | ℓ | 4,7 |
| VT 100/4/240 C. 375-380<br>AT 150/4/240 C. 275-280<br>VT 80/2/240 C. 369-370 | ℓ | 4,8 |
| AT-VT 150/4/340 C.285-290-295 /385-390-395 | ℓ | 8 |

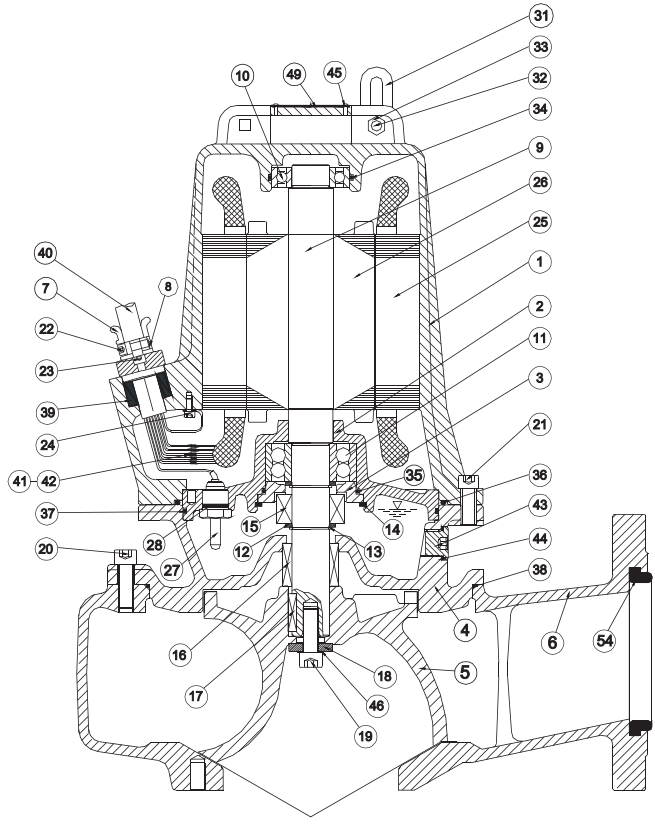
## 21. INSPECTION OF MOTOR INSULATION

At least once a year or after 4,000 hours of operation, check the motor for insulation.
Measure at the ends of the cable (disconnected from the board) using a mega-ohm-meter. Maximum test voltage is 1000 V direct voltage.
The earthing winding resistor should exceed 5 MΩ, otherwise measure twice, once for the cable, the other for the motor.
Disconnect the cable from the motor and measure the earthing winding by connecting all the ends of the winding.
- If the cable insulation is below 5MΩ, it means the cable is damaged.
- If the motor has low insulation values, it means the winding is faulty.

## 22. TOOLS

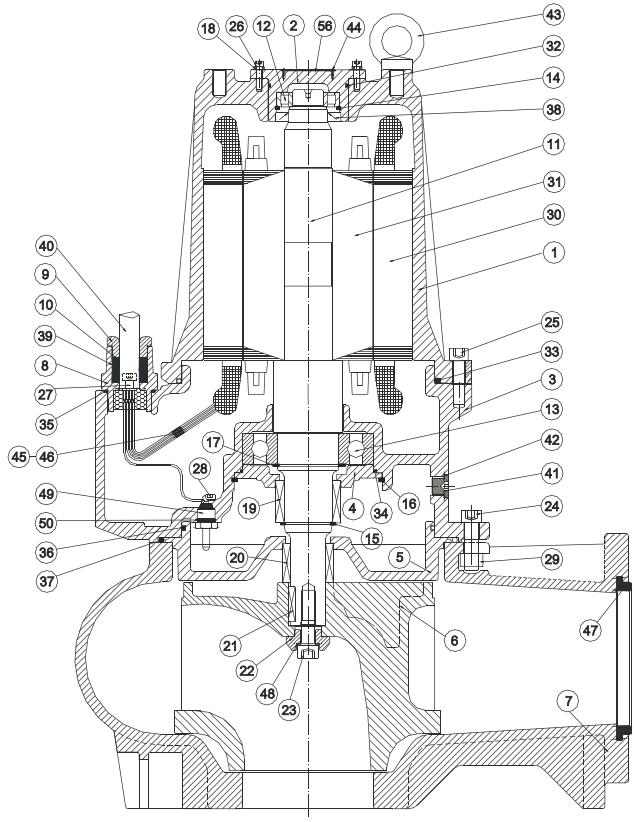
The tools required for normal maintenance of the pump are all the same:
-4-5-6-8-10-14-17 mm. Allen screwdrivers
-Circlip tongs;
-Cross-headed screwdriver;
-2 slotted-head screwdrivers;
-13-24-30 mm set screw wrench

# AT - VT 125/152/173
# HT 125/152/173



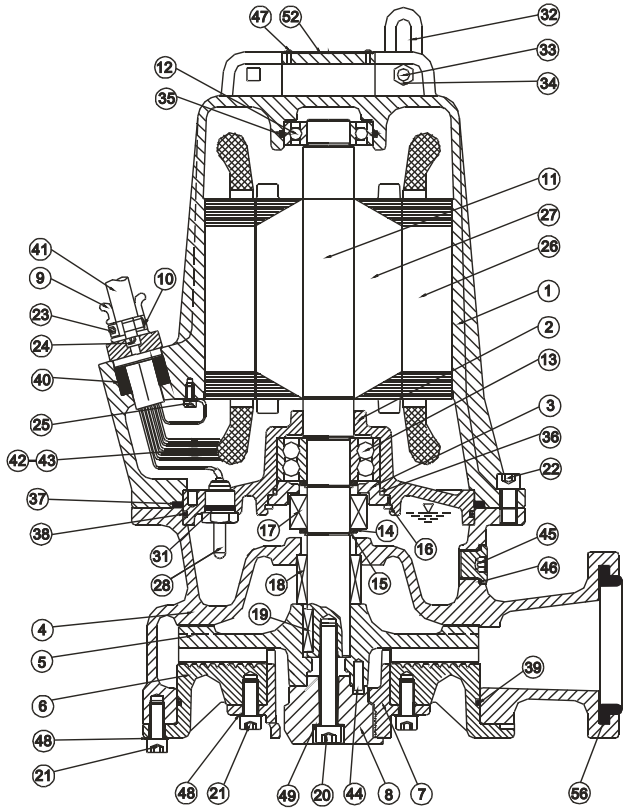

| POS. | DESCRIPTION | POS. | DESCRIPTION |
|---|---|---|---|
| 1 | MOTOR CASING | 23 | VTCEI UNI 5931 SCREW |
| 2 | BEARING HOLDER | 24 | VTCEI UNI 5931 SCREW |
| 3 | BEARING LOCKING RING | 25 | STATOR |
| 4 | MOTOR HOLDER | 26\9 | ROTOR |
| 5 | SINGLE CHANNEL IMPELLER (For series A 2-4 poles) | 27 | CONDUCTIVITY SEAL SENSOR |
| 5 | VORTEX IMPELLER (For series V 2-4 poles) | 28 | SENSOR ORING |
| 5 | DOUBLE-CHANNEL IMPELLER (For HM-T 50/2/125) | 29 | |
| 5 | FOUR-CHANNEL IMPELLER (For HT 152 and 173) | 30 | |
| 6 | PUMP BODY | 31 | CHAIN RING |
| 7 | CABLE GLAND | 32 | VTCEI UNI 5931 SCREW |
| 8 | CABLE GLAND TAB | 33 | HEXAGONAL HEAD NUT DIN 934 A2 |
| 9\26 | MOTOR SHAFT | 34 | ORING |
| 10 | UPPER BALL BEARING | 35 | ORING |
| 11 | LOWER BALL BEARING | 36 | ORING |
| 12 | AVP RING | 37 | ORING |
| 13 | UNI 7435 SNAP RING | 38 | ORING |
| 14 | UNI 7437 SNAP RING | 39 | CABLE ENTRY GLAND |
| 15 | UPPER MECHANICAL SEAL | 40 | H07-RNF CABLE |
| 16 | LOWER MECHANICAL SEAL | 41 | WHITE CABLEHEADS |
| 17 | TAB UNI 6604 | 42 | BLUE CABLEHEADS |
| 18 | WASHER | 43 | DIN 908 BRASS PLUG |
| 19 | VTCEI UNI 5931 SCREW | | OIL CHAMBER |
| 20 | VTCEI UNI 5931 SCREW | 44 | COPPER WASHER FOR OIL CAP |
| 21 | VTCEI UNI 5931 SCREW | 46 | UNI 8842 FAN-SHAPED WASHER |
| 22 | VTCEI UNI 5931 SCREW | 47 | UNI 1707 CYLINDRICAL PIN |

# AT - VT 200/240/340




| | | | |
|---|---|---|---|
| 4 | BEARING LOCKING RING | 31\11 | ROTOR |
| 5 | OIL CHAMBER CLOSING RING | 32 | ORING |
| 6 | SINGLE CHANNEL IMPELLER (For series A 2-4 poles) | 33 | ORING |
| 6 | VORTEX IMPELLER (For series V 2-4 poles) | 34 | ORING |
| 7 | PUMP BODY | 35 | ORING |
| 8 | CABLE GLAND | 36 | ORING |
| 9 | 1,1/4" GAS LOCKING RING | 37 | ORING |
| 10 | WASHER | 38 | LEAP SEAL |
| 11\31 | MOTOR SHAFT | 39 | CABLE ENTRY GLAND |
| 12 | UPPER BALL BEARING | 40 | H07-RNF CABLE |
| 13 | LOWER BALL BEARING | 41 | DIN 908 BRASS PLUG |
| 14 | UNI 7437 SNAP RING | | PHARMA GRAD. 19 OIL CHAMBER |
| 15 | UNI 7435 SNAP RING | 42 | COPPER WASHER OIL CAP |
| 16 | UNI 7437 SNAP RING | 43 | UNI 3266 EYEBOLT |
| 17 | UNI 7435 SNAP RING | 45 | YELLOW CABLEHEADS |
| 18 | AVP RING | 46 | WHITE CABLEHEADS |
| 19 | UPPER MECHANICAL SEAL | 47 | DN 150 GASKET (for series AT 4 poles and VT 150/4/340) |
| 20 | LOWER MECHANICAL SEAL | 47 | DN 100 GASKET (For series VT 100/4/200 and 100/4/240) |
| 21 | UNI 6604 TAB | 48 | UNI 8842 FAN-SHAPED WASHER |
| 22 | IMPELLER LOCKING WASHER | 49 | CONDUCTIVITY SEAL SENSOR |
| 23 | VTCEI UNI 5931 SCREW | 50 | SENSOR ORING |
| 24 | VTCEI UNI 5931 SCREW | | |
| 25 | VTCEI UNI 5931 SCREW | | |
| 26 | VTCEI UNI 5931 SCREW | | |
| 27 | VTCEI UNI 5931 SCREW | | |

# GT GRINDERS




| POS. | DENOMINAZIONE | POS. | DESCRIPTION |
|---|---|---|---|
| 1 | MOTOR CASING | 26 | STATOR |
| 2 | BEARING HOLDER | 27\11 | ROTOR |
| 3 | BEARING LOCKING RING | 28 | CONDUCTIVITY SEAL SENSOR |
| 4 | PUMP BODY UNIT | 29 | |
| 5 | IMPELLER | 30 | |
| 6 | CLOSING COVER | 31 | SENSOR ORING |
| 7 | FIXED PART GRINDER | 32 | CHAIN RING |
| 8 | ROTATING PART GRINDER | 33 | VTCEI UNI 5931 SCREW |
| 9 | CABLE GLAND | 34 | HEXAGONAL HEAD NUT |
| 10 | CABLE GLAND TAB | 35 | ORING |
| 11\27 | MOTOR SHAFT | 36 | ORING |
| 12 | UPPER BALL BEARING | 37 | ORING |
| 13 | LOWER BALL BEARING | 38 | ORING |
| 14 | AVP RING | 39 | ORING |
| 15 | UNI 7435 SNAP RING | 40 | CABLE ENTRY GLAND |
| 16 | UNI 7437 SNAP RING | 41 | H07 RNF CABLE |
| 17 | UPPER MECHANICAL SEAL | 42 | WHITE CABLE HEADS |
| 18 | LOWER MECHANICAL SEAL | 43 | BLUE CABLE HEADS |
| 19 | UNI 6604 TAB | 44 | UNI 1707 CYLINDRICAL PIN |
| 20 | VTCEI UNI 5931 SCREW | 45 | BRASS PLUG |
| 21 | VTCEI UNI 5931 SCREW | 46 | COPPER WASHER FOR OIL CAP |
| 22 | VTCEI UNI 5931 SCREW | 48 | UNI 8842 FAN-SHAPED WASHER |
| 23 | VTCEI UNI 5931 SCREW | 49 | UNI 8842 FAN-SHAPED WASHER |
| 24 | VTCEI UNI 5931 SCREW | 50 | UNI 1707 CYLINDRICAL PIN |
| 25 | VTCEI UNI 5931 SCREW | | |

# 24. Troubleshooting

| TROUBLE | POSSIBLE CAUSE | REMEDY |
|---|---|---|
| **1 - The electropump will not start** | a) There is no power supply. | a) Check the fuses to see if they are burnt or if a circuit protection relay has tripped. |
| | b) The selector is on OFF. | b) Select ON. |
| | c) Fuses have burnt due to an overload. | c) Replace the fuses. |
| | d) A phase is missing. | d) Check the line connections. |
| | e) The thermal protection circuit or the connections are not correct. | e) Close the thermal protection circuit or correct any faulty connection. |
| | f) The thermal relay has tripped. | f) Reset the thermal relay. |
| | g) The seal or bearing have seized. | g) Contact a specialist shop to replace the parts. |
| **2 - The electropump will not start but the overload relay trips.** | a) The voltage is too low or a phase is missing. | a) Check the fuses of the electric equipment and replace as required. |
| | b) The thermal relay has been calibrated too low. | b) Change the calibration. |
| | c) The input to the stator windings of the motor is not correct. | c) Check inputs: if the motor is a three-phase one, every phase must have the same value. If the disproportion exceeds 5%, contact a specialist shop. |
| | d) Check the motor for insulation. | d) Disconnect the power line and use a megaohm-meter to measure the resistance the motor winding. |
| | e) Check the hydraulic equipment. The pump body and the impeller might be clogged. | e) Remove the pump from the tank. Clean the pump body and the impeller; if required, also remove large debris from the bottom of the well. |
| | f) The pumped fluid is too thick. (specific gravity not to exceed 1.1 kg/dm$^3$). | f) Contact " DRENO POMPE S.r.l.". |
| **3 - The electropump will not stop** | a) Faulty stop control (Check the stop control). | a) Clean or replace the faulty stop control. |
| | b) The pump cannot drain the tank down to the stop level. | b) -There may be leaks in the pressing equipment inside the tank;<br>-The impeller or valves may be clogged;<br>- Install an electropump with a higher flow rate; |

| | | |
|---|---|---|
| **4 - The electropump works but the flow rate is poor or non-existent.** | a) The direction of rotation of the pump is not correct (three-phase motors only). | a) In three-phase motors, invert two phases of the power line (see Section 15, "Direction of rotation"). |
| | b) The delivery piping is clogged, the check valves and/or gate valves are partly closed. | b) Clean or repair all these hydraulic components. |
| | c) The pump efficieny has decreased. | c) Overhaul the pump, check the hydraulic components for wear and tear, replace worn parts as required. Check the impeller for clogging. |
| | d) The pump has been closed by an air pocket. | d) Switch off the electropump and switch it on again a few minutes later. |
| **5 - The electropump starts and stops too frequently.** | a)The pump is working with an excessively high number of start-ups/hour. | a)The collection trap is not adequate to the pump requirements. Or the check valve of the pump is faulty and when the pump stops it lets the pumped fluid flow back to the pump. |
| **6 - The electropump will not work in automatic mode.** | a) The level control equipment is faulty. | a) Check the connections and if it is the case replace the equipment |
| | b) The fluid level in the chamber is not sufficient to operate the pump. | b) Wait until the chamber fills up, to see if the level control equipment works. |
| **7 - The sound and/or light alarm for the electropump is on.** | a)There is water in the oil chamber for seal lubrication. | a)The impeller-side mechanical seal is not working properly; service it as soon as possible. |

| INTERVENTIONS RECORDING | | | SERIAL N°:_____ | |
|---|---|---|---|---|
| N° | DATE | WORKING HOURS | NOTES | SIGNATURE |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**DRENO POMPE SRL**
Z.I. Via Umbria, 15
35043 MONSELICE - PD - ITALY
Tel. 0429 - 73276 r.a.
Fax 0429 - 784316
www.drenopompe.it
e-mail : ufficiotecnico@drenopompe.it

Rivenditore o centro di assistenza
*Reseller or assistance centre*
Révendeur ou centre d'assistance agrées